

MINING RATING OF UNIVERSITY PERFORMANCE IN ACADEMIC PROGRAMS AND SERVICES

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ABSTRACT

Measuring service quality is a marketing trend that is gradually proving its worth in academic institutions. This study contributes to the growing body of knowledge on service quality measures in higher education (Aldridge, 1998). The purpose of this study is to identify the rating of the services of a select university. This study attempts to determine the ratings of students with regard to their level of satisfaction on a select university's academic programs, support services, and on facilities and laboratories starting from AY 2010-2011 up to AY 2014-2015. It also aims to compare evaluation results for five (5) consecutive academic years. It also intends to recommend improvements on the policy on the deployment of program evaluation and student services. The ratings for five consecutive academic years: AY 2010-2011, AY 2011-2012, AY 2012-2103, AY 2013-2014, and AY 2014-2015 shall be compared.

KEYWORDS: Data Mining, Student Evaluation, Customer Service, University Policies & Satisfaction Level

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INTRODUCTION

Background/ Objectives and Goals

Bakier defined EDM or “Educational data mining (also referred to as “EDM”) as “the area of scientific inquiry centered around the development of methods for making discoveries within the unique kinds of data that come from educational settings, and using those methods to better understand students and the settings, where they learn them” (Baker R. , 2009). Data mining, also called Knowledge Discovery in Databases (KDD), is the field of discovering novel and potentially useful information from large amounts of data. Data mining has been applied in a great number of fields, including retail sales, bioinformatics, and counter-terrorism. In recent years, there has been increasing interest in the use of data mining to investigate scientific questions within educational research, an area of inquiry termed educational datamining.

The discipline focuses on analyzing educational data to develop models for improving learning experiences and improving institutional effectiveness. Literature reviews on educational data mining cover topics such as student retention and attrition, personal recommender systems within education, and how data mining can be used to analyze course management system data (Huebner R. A., 2012).

This paper will be significant to the University, because this will provide mechanism to improve university programs and services in order to increase satisfaction level of students. Consequently, the findings of this study can be relevant to the accreditation efforts of the select university community and its compliance can ensure continuous

developments.

One of the services of the Guidance and Testing Center (GTC) of the select university is to conduct evaluation of programs and services through the exit interview given to graduating students. The objectives of this study are, to analyze the support services rating of the select university, in order to recommend policies and procedures for the improvement of academic programs.

One of the individual universities in Lebanon surveyed the satisfaction of their pupils with the university services and plans. The study related self-assessed knowledge of the university procedures, rules and regulations on six dimensions of satisfaction, being: academic experience, academic advisor, residential life, campus life, personal development opportunities, resources and student services (Nasser, 2008). The primary assumption of the survey is that knowledge about programs, conventions, and regulation is a predictor of satisfaction of students with programs and services.

The leadership role of management and faculty in a Pakistani University was studied to find out gaps in the delivery of technology integrated services in enrolment and advisory capacity. Their research also aims to find out the impact of the process of service delivery on customer loyalty and positive word of mouth, the key objectives for attaining quality. The study relates customer satisfaction to leaders' use of their cognitive resources, leadership styles and their relationship. Research findings suggest that dissatisfaction with technology integrated services is more frustrating than unavailability of the technology (Arif, 2011).

The proposal that, if academic advisement is provided effectively, it can help students in developing stable educational and career goals, and thus increases satisfaction and learning outcome (Kiran, 2010). Academic advisement can also help enrollment and retention rate and improve the quality of university programs (Lin, 1997). Faculty leadership style reflects some characteristics of visionary and affectionate relationship (Hagen, 2008), for example; empathic listening and demonstrating concern and keenness to solve students' problems which serves to indicate partial satisfaction of the students and faculty makes likewise intelligent use of cognitive resources.

In some researches on customer satisfaction in Universities, particularly on support services, a more distinct study is done to deepen understanding, perceived service quality and the level of satisfaction of the users. It is viewed that perceived service quality is a component of customer satisfaction (Nasser, 2008). Researchers suggest that service quality provides a superior indicator of user satisfaction and indicates that service quality can influence user satisfaction. Over time, repeated satisfaction with service encounters results in a perception of service quality (Pitt, 1995).

The tool in customer satisfaction survey must be studied in order to minimize methodological problems (Lin, 1997). Customer satisfaction surveys need to fulfill two needs. The first provides valuable information that enables a company to compare the performance of one business unit or several business units in different time periods and locations (Pitt, 1995). Second, customer satisfaction surveys can be rich source of information for generating continuous quality improvements.

Common problems include a tendency to show a high level of satisfaction, a lack of standard satisfaction

scales, the proliferation and excessive use of surveys (Altany, 1993). Another weakness of customer satisfaction surveys is that an increasing number of customers are tired of being surveyed (Reichheld, 1996). Moreover, so many customer satisfaction surveys appear to be just random data gathering of customer perceptions and opinions with little effort for intelligent follow-up and meaningful investigations (Godfrey, 1993). Researchers suggest that a sample should be large enough to obtain at least 100 respondents in each major subgroup of the target population (McDaniel, 1993).

Data mining refers to extracting or mining knowledge from large amounts of data. In Information Technology, huge amount of data are available that need to be turned into useful information. The researcher adopts hybridization of information that can be used for various applications and to view data mining as essential step in the process of knowledge discovery.

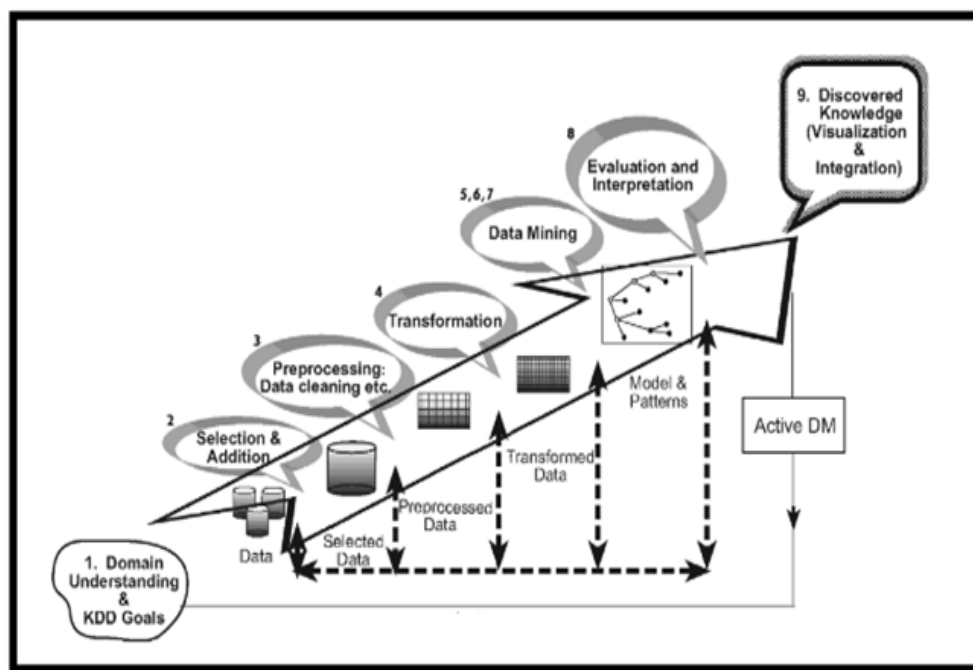


Figure 1: Hybridization of Information

- Domain Understanding and KDD Goals – This is the initial preparatory step that aims to understand the application domain, relevant prior notice and define goals of the end-user and the environment.
- Selection and Addition – in this step, selecting a data set and focusing on a subset of variables or data samples are to be performed.
- Preprocessing and Data cleaning – at this stage, data reliability is enhanced. It covers the removal of noise or outliers, collecting necessary information to model or account for noise.
- Transformation – a process by which data are transformed or consolidated into forms appropriate for mining by performing summary or aggregation operations.
- Data mining – in this step, intelligent methods are applied in order to extract data patterns

- Evaluation and Interpretation – in this step, data to be evaluated and interpreted
- Discovering Knowledge – representation of techniques are used to present the mined knowledge to the user.

METHODS

Data and Methods

The survey questionnaire includes background information about the students for the analysis of their demographic profile. It is divided into three (3) areas namely Evaluation of the Academic Areas and Service Departments, Facilities and Laboratories and Over-all satisfaction of students on their stay in the University.

The Evaluation of the Academic Areas is subdivided into three (3) parts, which include Academic Program, Quality of Teaching and Faculty. There are five (5) items for Academic Program and Faculty and three (3) items for Quality of Teaching. For Academic program, students were asked if they agree or disagree that the objectives of the program were clearly stated; subject in the curriculum checklist were applicable to chosen program; course outline was strictly followed; grading outline was clear at the start of the semester; and practicum hours were adequate. For Quality of teaching, it indicates if students agreed that there were adequate/updated book references for the subject, instructional materials were appropriate for learning and concepts discussed were applicable in the field. For the Faculty, it asks whether students agreed that professors showed mastery of the subject matter, lessons are communicated clearly to them, teachers used variety of teaching strategies, professors are available for consultation and professors maintained professional relationships.

The Evaluation of Service Departments consists of 13 non-teaching sections namely: Academic Resource Center, Accounting Office, Campus Ministry, Canteen, Dean's Office, Guidance and Testing Center, Health Services Department, Information Technology Department, Maintenance Department, Research and Publication Center, Security Department, Student Affairs Office and Student Records Management Department. Each department was rated whether Personnel were courteous and approachable, Policies and Procedures implemented are efficient and Programs conducted for students are sufficient. There are 16 facilities and 10 laboratories being rated. The students were asked to rate those that are applicable to them. An overall satisfaction item is also included on a separate item.

The 5-point Likert Scale was used in the survey to measure level of agreement on both academic programs and service units (Strongly agree to strongly disagree), to rate the facilities and laboratories (excellent to poor) and to determine the over-all level of satisfaction of students (very satisfied to very dissatisfied).

Algorithm

Visualization

“Data visualization” is the process by which textual or numerical data are converted into meaningful images. The reason why the data visualization can help on data mining is that the human brain is very effective in recognizing large amounts of graphical representations (C. Healey, 2014).

Today's data visualization tools go beyond the standard charts and graphs used in Excel spreadsheets,

displaying data in more sophisticated ways such as info graphics, dials and gauges, geographic maps, spark lines, heat maps, and detailed bar, pie and fever charts. The images may include interactive capabilities, enabling users to manipulate them or drill into the data for querying and analysis.

Indicators designed to alert users, when data has been updated or predefined conditions occur can also be included.

Classification and Prediction Patterns

Classification is one of the most common learning models in data mining. It captures the relations of attribute variables, which are supported by a given set of data records (Parasuraman, 1991). Classification models predict categorical class labels; and prediction models predict continuous valued functions.



Figure 2: Classification Model

Forecasting

Forecasting is the process of making predictions of the future based on past and present data and analysis of trends. A commonplace example might be estimation of some variables of interest at some specified future date.

RESULTS

Here are the results of the data gathering:

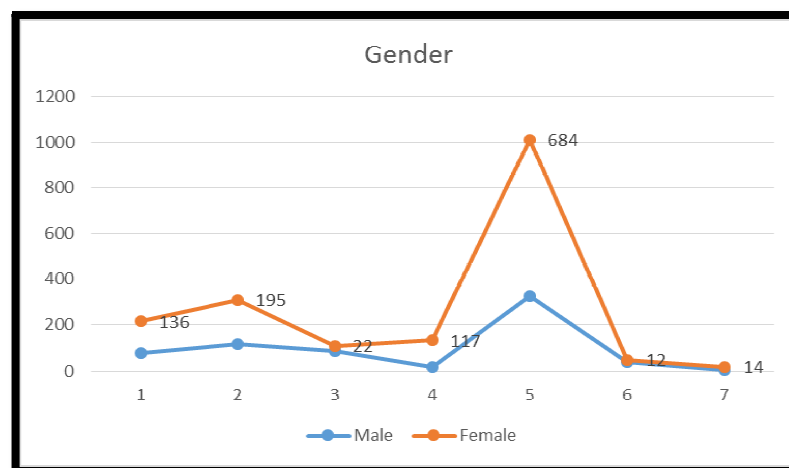


Figure 3: Gender of Respondents According to Colleges

Figure 3 shows that there are more girls than boys enrolled in the institution.

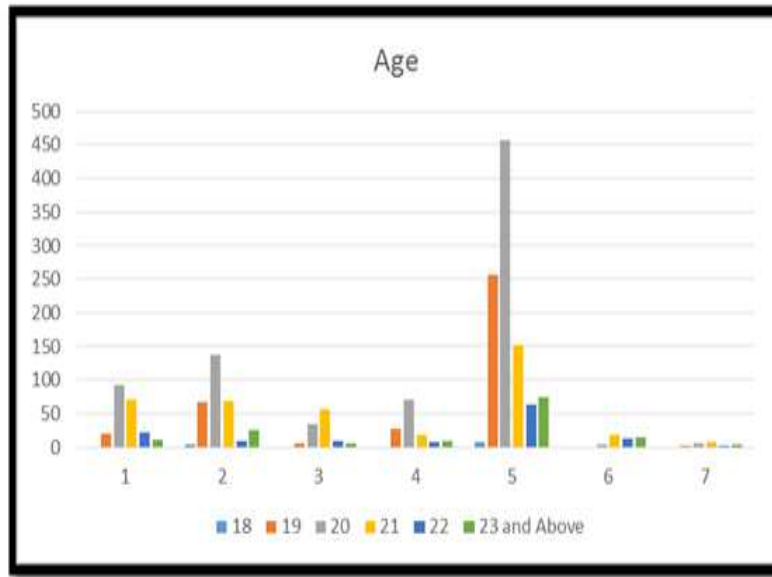


Figure 4: Age of Respondents According to Colleges

Figure 4 shows that among the seven colleges of the university, most of the respondents are from students whose age is 22.

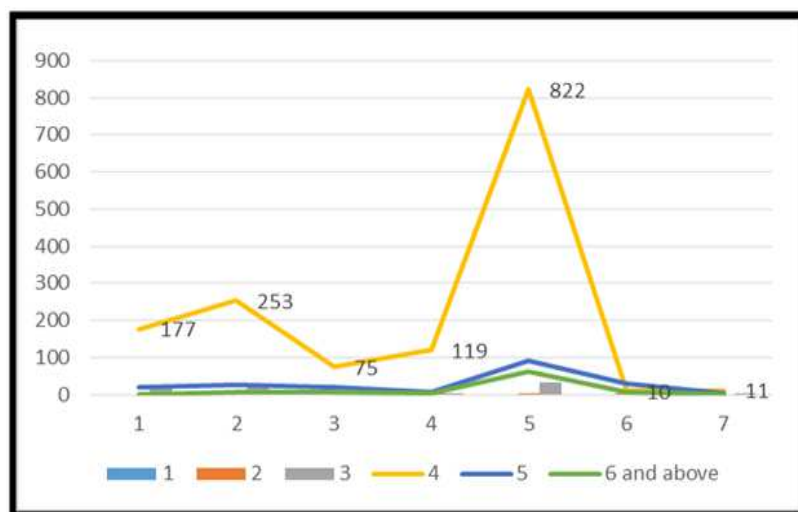


Figure 5: Respondents According to Years of Staying in the University

Figure 5 shows that among the seven colleges of the select university, the most number of respondents are fourth year students.

The services of the select university was evaluated according to areas such as Academic Program, Quality of Teaching, Faculty, academic Areas, Service Department, and Laboratories from AY 2010-2011 to AY 2014-2015.

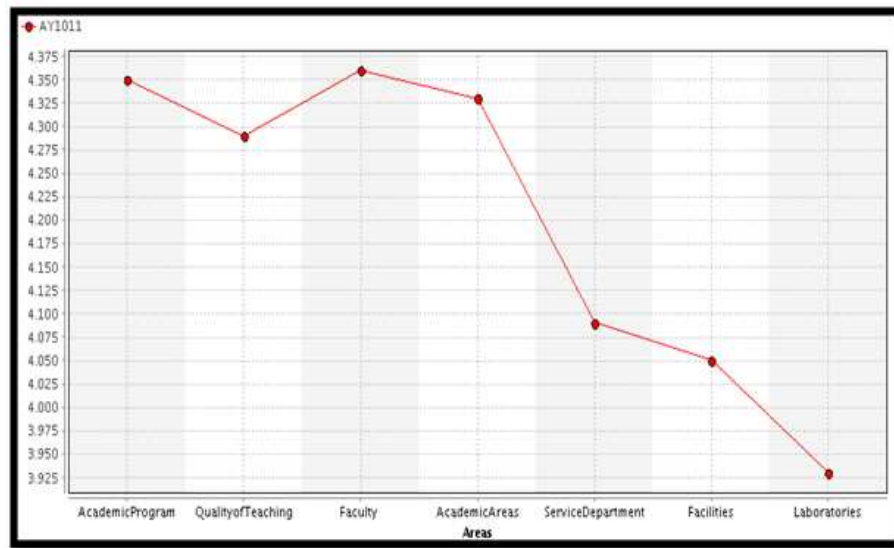


Figure 6: Academic Evaluation for AY2010-2011

The Figure 6 shows the evaluation for AY2010-2011. The highest rating was given to the faculty followed by the academic programs and academic areas. The lowest rating was given to the service department, facilities, and laboratories.

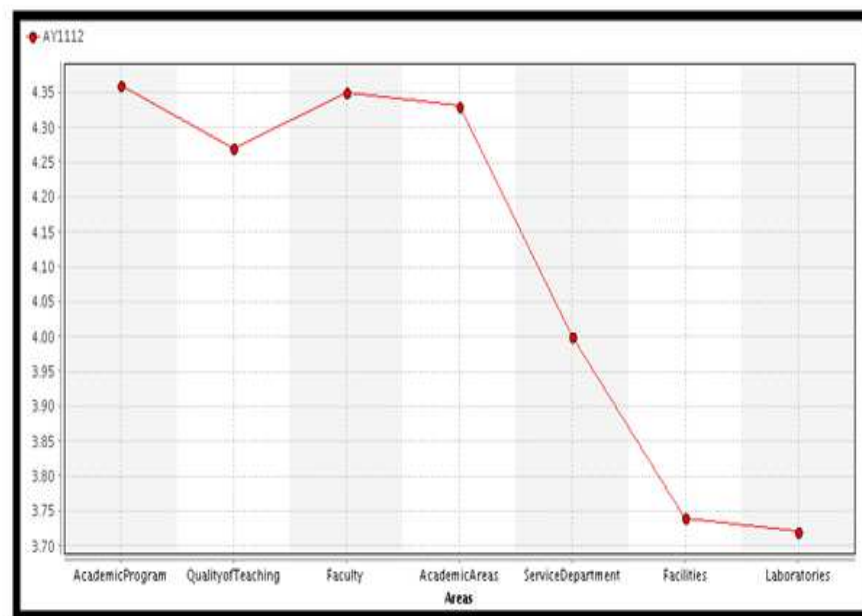


Figure 7: Academic Evaluation for AY 2011-2012

The result of the evaluation for SY 2011-2012 has two areas on top, the academic program, and faculty followed by academic areas and quality of teaching. The lowest rating given was still in the laboratories and it was noticed that the facilities went down on this academic year.

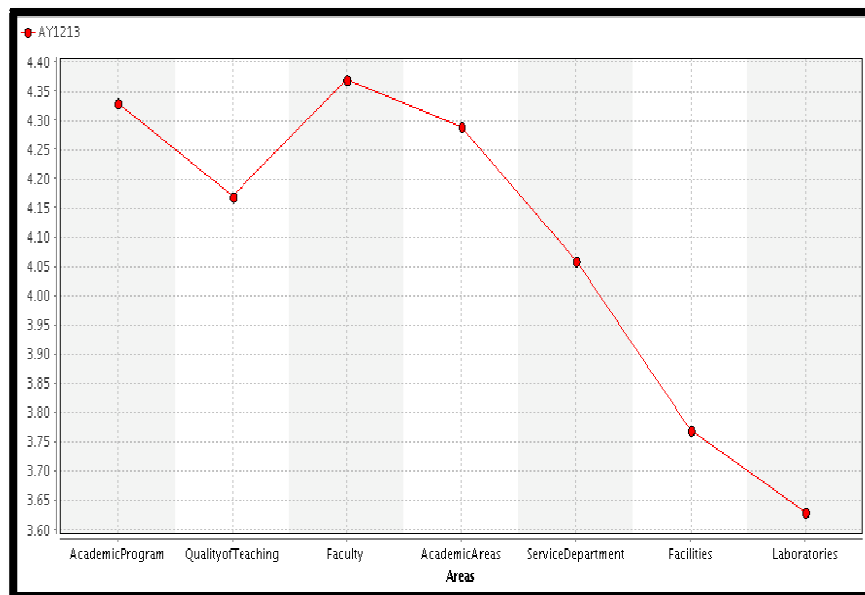


Figure 8: Academic Evaluation for AY 2012-2013

For AY 2012-2013, still on the top rating is the faculty area followed by academic program and academic area. At the bottom rating is still the laboratories and facilities.

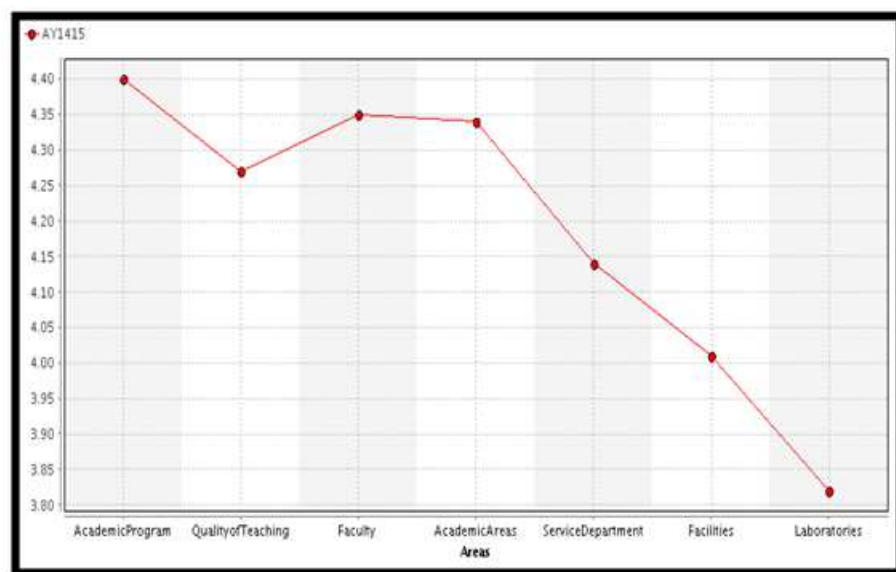


Figure 9: Academic Evaluation for AY 2013-2014

For AY 2013-2014, faculty did not remain on top but just third to academic program, and academic areas. While at the bottom is still laboratories and facilities.

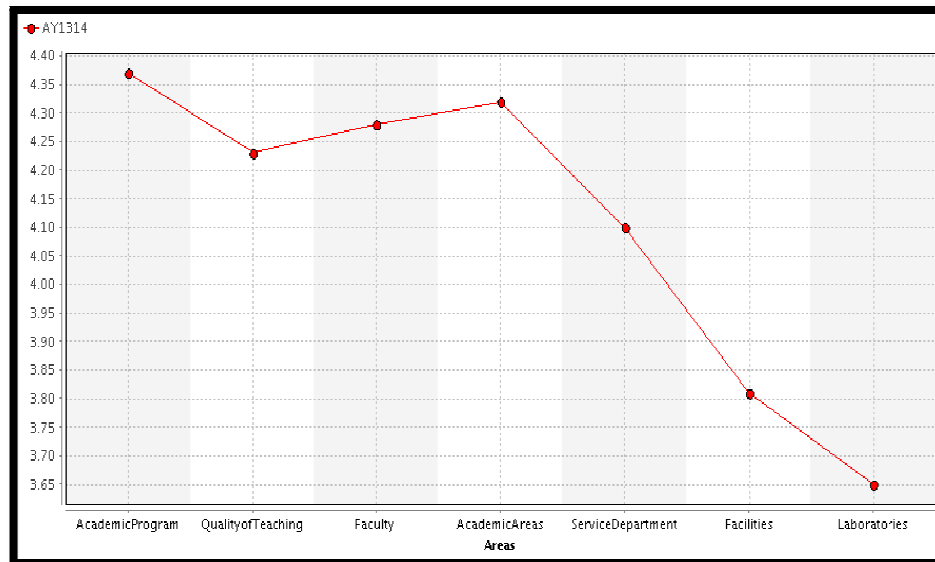


Figure 10: Academic Evaluation for AY 2014-2015

AY 2014-2015 shows that academic program is on top followed by faculty and academic areas tied on the second spot. At the bottom is consistently the laboratories and facilities is gaining rating, but still at the bottom 2.

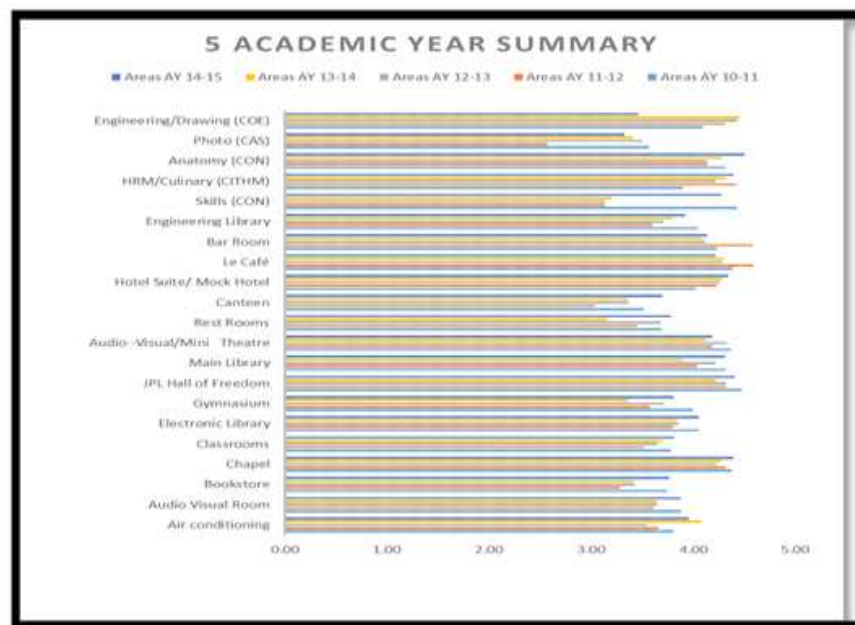


Figure 11: Evaluation of Laboratories and Facilities

Figure 9 shows that JPL Hall was ranked number 1, followed by Chapel ranked number 2, and Main Library ranked number 3.

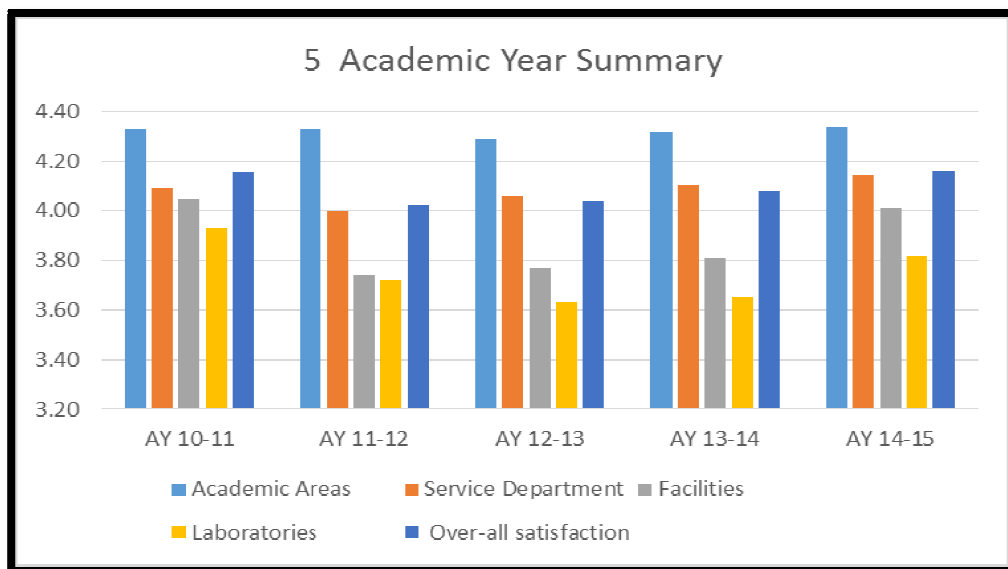


Figure 12: Over-all Summary of 5 Academic Years

Figure 10 shows that, since Academic Year 2010 to 2015, AY 2010 – 2011 was ranked number 1 in terms of over-all satisfaction rating in Academic Areas, Services Department, Facilities and Laboratories

CONCLUSIONS

The service areas of the select university for AY 2010 to AY 2014-2015 brought about the realization that the students are satisfied with the faculty and the academic programs and academic areas, however, the laboratories and facilities are consistently low in rating for the past five academic years. This is an alarming fact for the laboratories and facilities administrators. These bottom two areas are commonly identified in the accreditation instrument of different accrediting bodies. If not corrected, this might result to low accreditation rating or non-compliance to the instrument.

RECOMMENDATIONS

The following are recommendations in order to improve the facilities and laboratories:

- Improvements in the academic areas can be prioritized in enhancing quality of teaching by providing adequate/updated book reference for the subject and instructional materials that are appropriate for learning.
- For service departments, all units must enhance their mechanisms as well as procedures and programs especially for those departments that obtained lower ranks. Improvements can be facilitated by using the comments and suggestions of the students, making feasible plan of actions and monitoring timetables for the action plans.
- Facilities such as Bookstore, Canteen and Engineering Library (COE), Restrooms, Classrooms, Air-conditioning can be given priority for renovations as well as the Photo Laboratory (CAS), Skills (CON),

Biology (CAS & CITHM) and Physics (CAS, CITHM and COE) for the laboratories.

- Continuous monitoring of students' satisfaction level as well as factors that may cause their dissatisfaction.

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